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# **THE BRIDGING ROLE OF EXPATRIATES AND INPATRIATES IN KNOWLEDGE TRANSFER IN MULTINATIONAL CORPORATIONS**

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## **THE BRIDGING ROLE OF EXPATRIATES AND INPATRIATES IN KNOWLEDGE TRANSFER IN MULTINATIONAL CORPORATIONS**

### **Abstract**

Drawing on the knowledge-based view of the firm, this paper provides the first empirical study that explicitly investigates the relationship between different categories of international assignees and knowledge transfer in multinational corporations (MNCs). Specifically, we examine (1) the extent to which expatriate presence in different functional areas is related to knowledge transfer from and to headquarters in these functions; and (2) the extent to which

different categories of international assignees (expatriates vs. inpatriates) contribute to knowledge transfer from and to headquarters.

We base our investigation on a large scale survey, encompassing data from more than 800 subsidiaries of MNCs in thirteen countries. By disaggregating the role of knowledge transfer across management functions, directions of knowledge transfer, and type of international assignees, we find that (1) expatriate presence generally increases function-specific knowledge transfer from and, to a lesser extent, to headquarters; and that (2) the relevance of expatriates and former inpatriates varies for knowledge flows between headquarters and subsidiaries. Additionally, we discuss implications for research and practice, in particular regarding different management functions and different forms of international assignments, and provide suggestions for future research.

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## Introduction

Over the past decade, an increasing number of studies have highlighted the role of international assignees as carriers of knowledge across units of multinational corporations (MNCs; Chang, Gong, & Peng, 2012; Fang, Jiang, Makino, & Beamish, 2010; Mäkelä & Brewster, 2009). Evidence further suggests that at the subsidiary level this knowledge is not only transferred by traditional parent country national (PCN) expatriates but also by other forms of assignees, i.e., third country nationals (TCNs; Hocking, Brown, & Harzing, 2007) and inpatriates, i.e., local managers that have been inpatriated to HQ (Reiche, 2011; Tharenou & Harvey, 2006). It has also been argued that international assignees not only influence cross-unit knowledge transfer through their own direct, personal contact but also by linking previously unconnected actors and their knowledge across MNC units (Kostova & Roth, 2003; Reiche, Harzing, & Kraimer, 2009).

Although knowledge transfer is commonly viewed as the primary motive for relocating staff abroad (e.g. Harzing, 2001a), it is remarkable that research which examines the relative importance of the various types of international staff identified above (PCNs, TCNs and inpatriates) for cross-unit knowledge transfer is practically non-existing. This is an important shortcoming for two reasons. First, initial evidence suggests that global staffing practices are changing (Collings, Scullion, & Morley, 2007) and that organizations are increasingly using a portfolio of international assignees (e.g., Collings, McDonnell, Gunnigle, & Lavelle, 2010). However, we know little about how these changing patterns relate to knowledge transfer, even when comparing assignment types of similar duration and hence similar opportunities for knowledge transfer, such as long-term PCNs, TCNs and inpatriates. Second, research implicitly assumes that these three forms of international assignees carry similar types of knowledge given they are all in the position, either during or after their assignments, to diffuse

knowledge from the corporate headquarters (HQ) to its subsidiaries, and from subsidiaries to the HQ. However, this may not necessarily be true, for example due to motivational reasons of the individual assignee (Lazarova & Tarique, 2005) or the MNC unit (Mudambi & Navarra, 2004), therefore calling for a more explicit test of that assumption. In addition, previous research has tended to examine international assignees' roles as knowledge agents at an aggregate level without explicitly studying potential differences on the level of functional areas. However, a recent study by Fang et al. (2010) has shown that the use of expatriates may have distinct effects on the transfer of technological and marketing knowledge to subsidiaries.

The current study draws on the knowledge-based view of the firm (Felin & Hesterly, 2007; Grant, 1996) to address these gaps in our understanding and make the following two contributions. First, our study comprehensively investigates the extent to which having expatriates heading up specific functional areas is linked to knowledge transfer from and to HQ in this area. Second, we compare the extent to which expatriates and former inpatriates contribute to MNC knowledge flows, thereby integrating what have been thus far largely separate research samples (e.g., Mäkelä & Brewster, 2009; Reiche, 2011). Although a few previous studies have compared the use of PCNs, TCNs and inpatriates (Collings et al., 2010; Peterson, 2003; Shaffer, Harrison, & Gilley, 1999), we know little about how the use of these different assignment types affects MNC knowledge transfer from and to HQ.

In sum, our study provides a much more differentiated approach to studying knowledge transfer than previous research has been able to offer, by disaggregating the role of knowledge transfer across management functions, directions of knowledge transfer, and type of international assignees. Furthermore, as our empirical data were drawn from a large and varied range of home and host countries, we are also able to show how variable staffing patterns are across national boundaries, highlighting the relevance of local context.

## Theory and Hypothesis Development

The knowledge-based view of the firm conceptualizes MNCs as differentiated networks of globally dispersed knowledge resources (Grant, 1996; Kogut & Zander, 1993), which makes the transfer of valuable knowledge from one unit to the other an important condition for sustained success (Gupta & Govindarajan, 2000; Jensen & Szulanski, 2004). Whereas these conceptualizations commonly view knowledge to reside at the firm, scholars increasingly highlight the role of individual heterogeneity and individuals' non-random distribution even within organizational units, which requires individual actors to diffuse, allocate and assimilate knowledge (Felin & Hesterly, 2007; Foss & Pedersen, 2004; Lenox & King, 2004). In the context of cross-unit knowledge transfer in MNCs, we can distinguish the following actors at the subsidiary level: local managers who have always worked in their domestic context, local managers with previous inpatriate experience at HQ (henceforth, former inpatriates), PCN expatriates, and TCN expatriates. All except the first group can be subsumed under the category of international assignees. It has been suggested that such assignees serve as important knowledge agents because they can transfer both tacit and explicit knowledge types and may support the necessary adaptation of knowledge from one context to the other (Argote & Ingram, 2000; Hocking et al., 2007).

Knowledge transfer through international staff may also occur through different channels (Fang et al., 2010; Reiche et al., 2009). Specifically, international assignees can either engage in *direct* knowledge transfer with staff at their home or host units, or they may transfer knowledge *indirectly* by brokering cross-unit relationships that home- and host-unit staff can leverage for future knowledge exchanges between their units. Assignees engage in direct knowledge transfer by sharing home-country knowledge such as HQ culture and management practices with their host-unit colleagues (Chang et al., 2012), accessing task-related knowledge for their own professional development (Reiche, 2012), and diffusing their host-country

learning back to the home unit (Lazarova & Tarique, 2005). This is especially important when the knowledge is complex and tacit in nature and therefore requires direct personal contact and an understanding of both the sending and recipient context (Argote & Ingram, 2000).

Assignees transfer knowledge indirectly by acting as boundary spanners that link home- and host-unit staff, thereby developing inter-unit social capital and facilitating the exchange of previously unconnected knowledge across MNC units (Kostova & Roth, 2003; Reiche et al., 2009). Assignees may also enhance the host unit's absorptive capacity, understood as the "ability to recognize the value of new information, assimilate it, and apply it to commercial ends" (Cohen & Levinthal, 1990: 128). This is because these individuals can help allocate common knowledge stocks to ease transfer (Lenox & King, 2004), and they share meanings, values and language systems between the sending and recipient units, thereby indirectly increasing the likelihood of cross-unit transfer success (Fang et al., 2010). Although the two mechanisms form distinct knowledge activities, they are likely to be related because an assignee may need to provide home- and host-unit staff with context-specific information for them to be able to benefit from future cross-unit exchanges (Reiche, 2011).

The notion that knowledge is imperfectly distributed across individual and intra-organizational actors has two additional implications. First, as MNCs increasingly employ TCNs and inpatriates in addition to expatriates (Collings et al., 2010) this raises the question to which extent these types of assignees engage in knowledge transfer across MNC units. For example, whereas traditionally PCNs served as knowledge agents, we would expect inpatriates and TCNs to increasingly take on this role too (e.g., Tharenou & Harvey, 2006). Second, previous research has primarily considered international assignees' roles as knowledge conduits at an aggregate level such that we know little about whether their knowledge agency applies similarly to each functional area.

In the remaining sections, we develop a set of hypotheses about the role of international staff for knowledge transfer in MNCs. More particularly, we aim to examine (1) the extent to



which expatriates heading up specific functional areas is linked to knowledge transfer from and to HQ in each of these functions, and (2) the relative extent to which expatriates and former inpatriates contribute to knowledge transfer from and to HQ. Whereas for the first question we take a function-level perspective to examine the role of senior expatriate managers in a given function for the transfer of function-specific knowledge between HQ and subsidiaries, for the second question we focus on the general population of international staff at the subsidiary level and examine the role of expatriates and former inpatriates in knowledge transfer between HQ and subsidiaries.

### *Expatriates as Heads in Different Functions and Implications for Knowledge Transfer*

In a first step, we conceptualize a relatively higher importance of knowledge transfer through expatriates compared to purely local managers. Specifically, as previous research has shown that expatriates engage in knowledge agency not only from HQ to subsidiaries (Chang et al., 2012) but also in the reverse direction (Lazarova & Tarique, 2005), we propose that expatriates are able to transfer more knowledge in comparison to purely local subsidiary managers both from HQ to its subsidiaries, and from subsidiaries to HQ.

More specifically, expatriates in the *managing director* position should be able to engage in more knowledge transfer than local managers because the former will have greater access to information and influence, and therefore are more likely to be perceived as a social resource by other organizational members (Lin, Ensel, & Vaughn, 1981). As a result, expatriates in the managing director position will be better able to transfer knowledge because they are likely to be connected to a greater number of actors at the HQ, the focal subsidiary and other MNC units, and have potential access to a greater variety of knowledge resources (Reiche et al., 2009).

We also predict that expatriates heading the *R&D* function will engage in more knowledge transfer than local managers. From the perspective of HQ control, Mudambi and

Navarra (2004) argue that a large part of MNCs' R&D activities are increasingly located at the subsidiary level, which gives subsidiaries substantial influence in the MNC network. Expatriates, especially PCNs, as heads of the R&D function should be able to reduce this dependency. Similarly, TCNs are thought to be more effective mediators of goal conflict, for example in determining the extent of sharing sensitive R&D knowledge between HQ and subsidiary, which cannot be resolved impartially by either local managers or PCNs (Harvey, Speier, & Novicevic, 2001). Technological knowledge also tends to be less context-specific (Kogut & Zander, 1992) and a large part of R&D activities occur across organizational boundaries (Fey & Birkinshaw, 2005). Therefore, PCNs and TCNs heading the subsidiary R&D function are in a better position to share resources between the HQ and subsidiary R&D teams and facilitate the continuous exchange of ideas than purely local managers.

We further expect expatriates heading the *Manufacturing* function to engage in more knowledge transfer compared to local managers. While market-specific characteristics such as the size and volume of products or their perishability may make it more difficult to buy from foreign suppliers or manufacture globally, scholars have highlighted the need for tiered supply chains that mix local and offshored production to maintain adaptability (Lee, 2004). Therefore, we would expect expatriates to play important roles of knowledge agency to support the coordination of these activities between HQ and subsidiaries.

Finally, research suggests that knowledge specific to the functions of *HRM* (Schuler & Rogovsky, 1998), *Marketing* (Fang et al., 2010) and *Logistics* (Luo, Van Hoek, & Roos, 2001) are characterized by relatively high location specificity, which may limit the transfer of knowledge in these functions. At the same time, evidence suggests that MNCs nevertheless exchange knowledge across their operations related to the HRM function (Mäkelä, Sumelius, Höglund, & Ahlvik, 2012), Marketing function (Katsikeas, Samiee, & Theodosiou, 2006) and Logistics function (Rushton & Walker, 2007). Given their contextual knowledge of both the

sending and receiving units, we would expect expatriates to be in a better position to transfer this knowledge than local managers.

In sum, we would expect that the extent of knowledge transfer from and to HQ in each of the functional areas will be significantly higher if the subsidiary employs an expatriate in that respective function instead of a local manager. Of course, in principle this argument applies equally to inpatriates. Unfortunately, we were not in the position to collect data with regard to the number of managers in various top positions who had prior inpatriate experience and hence are forced to limit this hypothesis to expatriates (PCNs and TCNs). Therefore:

*Hypothesis 1a: Irrespective of the functional area, the extent of knowledge transfer from HQ to subsidiary will be significantly higher in the various functional areas for subsidiaries that employ an expatriate rather than a local as a functional area head.*

*Hypothesis 1b: Irrespective of the functional area, the extent of knowledge transfer from subsidiary to HQ will be significantly higher in the various functional areas for subsidiaries that employ an expatriate rather than a local as a functional area head.*

#### *Relative Role of International Assignees for Knowledge Transfer According to Assignment Type and Transfer Direction*

Staffing foreign subsidiaries with expatriate managing directors or function heads may be driven by reasons of filling positions due to a lack of local candidates, developing HQ or TCN managerial talent, or ensuring control and coordination (Edström & Galbraith, 1977). However it may also improve communication and information flows between the HQ and its subsidiaries (Harzing, 2001b). As detailed above, expatriate managing directors and function heads in foreign subsidiaries can be expected to contribute to knowledge transfer from and to HQ.

The following set of hypotheses accounts for two additional characteristics of MNC

knowledge transfer through international assignees. First, research suggests that differences in seniority and the associated differences in power and status of knowledge agents may affect knowledge transfer in MNCs (Mäkelä & Brewster, 2009; Mudambi & Navarra, 2004). While Hypotheses 1a-b propose that the use of expatriate managers in top management functions will lead to a higher degree of function-specific knowledge transfer between HQ and subsidiary, here we are interested in examining the extent to which knowledge transfer between HQ and subsidiary occurs according to the relative prevalence of expatriates more generally, i.e., considering expatriates at any hierarchical level in the organization.

Second, evidence suggests that knowledge transfer between HQ and subsidiary will be increasingly driven not only by PCNs but also by TCNs and inpatriates (Hocking et al., 2007; Tharenou & Harvey, 2006). For example, the use of inpatriation may help to enhance corporate socialization by diffusing HQ culture to inpatriates and, by extension, upon their return to their subsidiary peers, thus increasing interpersonal familiarity, personal affinity and greater commonalities in cognitive maps between HQ and its subsidiaries (Fang et al., 2010). So far, no previous study has explicitly contrasted the roles of different types of assignees for cross-unit knowledge transfer. Here we will focus on two kinds of comparisons: first, we compare the effect of expatriate and former inpatriate managers on knowledge transfer with that of local managers, considering both knowledge transfer from and to HQ. Second, we compare the effect of expatriate managers on knowledge transfer with that of former inpatriate managers, again for both directions of knowledge transfer.

We first predict that subsidiaries employing expatriates and/or former inpatriates will display a higher degree of knowledge transfer *from HQ to subsidiaries* compared to subsidiaries without international staff. For example, expatriates have been found to access and apply HQ knowledge to the subsidiary unit during their assignments (Hocking et al., 2007). Research has also shown that former inpatriates transfer HQ knowledge to their home subsidiary upon completion of their HQ posting because subsidiary colleagues are likely to

assess this knowledge as valuable (Reiche, 2012). In addition, expatriates and former inpatriates should be able to facilitate knowledge transfer from HQ through their boundary spanning. For example, given their intimate understanding of the HQ organization PCN expatriates and former inpatriates will be able to introduce HQ staff to their relevant subsidiary counterparts, thereby initiating cross-unit exchanges (Kostova & Roth, 2003). They may also convey contextual information to their subsidiary colleagues to increase the subsidiary's absorptive capacity and ensure it is better able to understand and make sense of knowledge that it acquires from other HQ staff (Fang et al., 2010). Similarly, compared to purely local managers TCNs tend to be more sensitive to cultural and political issues in the wider MNC (Harvey, 1996; Shaffer et al., 1999) and may hence be more conscious about contextual differences that may affect knowledge transfer from HQ to the subsidiary. Taken together, we hypothesize:

*Hypothesis 2a: The extent of knowledge transfer from HQ to subsidiaries will be significantly higher for those subsidiaries that employ expatriates and/or former inpatriates compared to those that do not.*

Second, we also predict that subsidiaries employing expatriates and/or former inpatriates will display a higher degree of knowledge transfer *from subsidiaries to HQ* compared to subsidiaries without international staff. This is because during their assignments expatriates acquire subsidiary-specific knowledge that is relevant for and subsequently gets adapted to the wider MNC context, including the HQ (Hocking et al., 2007; Lazarova & Tarique, 2005). Similarly, subsidiary managers who have experienced the HQ environment can better assess what type of subsidiary knowledge is valued by HQ and may therefore more actively transfer this knowledge. Given the social relationships that they have developed and maintain at both HQ and subsidiary levels (Kostova & Roth, 2003; Reiche et al., 2009), PCN expatriates and former inpatriates will also be able to actively connect subsidiary staff with HQ

staff to initiate cross-unit exchanges. Similarly, TCNs are thought to effectively mediate between HQ and subsidiaries (Harvey et al., 2001) and are therefore also likely to be trusted as brokers between both units. Hence:

*Hypothesis 2b: The extent of knowledge transfer from subsidiaries to HQ will be significantly higher for those subsidiaries that employ expatriates and/or former inpatriates compared to those that do not.*

Third, we predict that subsidiaries employing former inpatriates and those employing expatriates will display similar levels of knowledge transfer *from HQ to subsidiaries*. Supporting knowledge outflows from HQ is a key motive for sending expatriates to an MNC's foreign subsidiaries (Chang et al., 2012; Fang et al., 2010). However, research shows that inpatriates also transfer HQ knowledge to their subsidiaries upon repatriation (Reiche, 2012). Consequently, we assume that inpatriates who have completed their HQ assignments should be able to engage in similar levels of such knowledge transfer from HQ to subsidiaries. This is because former inpatriates are likely to be aware of the relevant knowledge sources at HQ, and they may continue to maintain social relationships with HQ staff. We propose:

*Hypothesis 2c: The extent of knowledge transfer from HQ to subsidiaries will be similar for subsidiaries that employ former inpatriates and those that employ expatriates.*

By contrast, we assume that subsidiaries employing former inpatriates will display higher levels of knowledge transfer *from subsidiaries to HQ* compared to those that employ expatriates for two main reasons. First, inpatriates may be more competent in transferring context-specific knowledge about their local subsidiary to HQ, especially if the subsidiary is culturally and institutionally different from the HQ country and if HQ managers have little prior experience about this market (Harvey et al., 2001). Indeed, transferring local and context-specific knowledge to HQ is a key benefit that MNCs gain from reverse resource flows (Ambos, Ambos, & Schlegelmilch, 2006). By contrast, given the limited amount of time that

expatriates spend in the host environment they may not be able to fully make sense of this context-specific knowledge (Bhagat, Kedia, Harveston, & Triandis, 2002) and hence may struggle to effectively convey its meaning and value to colleagues at HQ.

Second, former inpatriates have already completed their assignments and returned home (i.e., to their subsidiary) where they can fully utilize both their experiences and relationships developed at HQ to transfer, or help transfer local knowledge to HQ. By contrast, expatriates who are currently on assignment may be less able to transfer knowledge back to HQ, because they might not have spent sufficient time in the host country yet, so that they either have not yet learned enough about the host-unit context or have not yet sufficiently developed relationships with subsidiary staff to access and connect relevant knowledge resources. Further, previous research has identified various contingencies that may prevent assignees to transfer knowledge to their home units *during* their assignment, including lack of communication with the sending unit (Reiche et al., 2009) and lack of face-to-face contact (Mäkelä & Brewster, 2009). Therefore:

*Hypothesis 2d: The extent of knowledge transfer from subsidiaries to HQ will be higher for subsidiaries that employ former inpatriates compared to those that employ expatriates.*

## **Methods**

### *Sample and Data Collection*

Data were collected at subsidiary level, i.e. in the foreign subsidiaries of MNCs located in various host countries. Most studies on international assignees have focused on a relatively small number of home and/or host countries. In our study, we collected data in thirteen countries. As most previous research on expatriation has only included one Asian country (Japan), we added Korea and China as two further significant Asian countries, as well as Australia/New Zealand as “Western” countries in the Asia Pacific. In Europe, we included four larger countries, Germany, France, the UK and Spain as well as four smaller Nordic countries

(Sweden, Denmark, Finland and Norway). Our subsidiaries were operating in a wide range of industries. In terms of home country, we collected data from MNCs headquartered in more than two dozen different home countries. Table I provides an overview of the distribution of our sample across host country, industry and home country.

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Insert Table I about here  
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We sampled majority owned subsidiaries with more than 100 employees, with addresses purchased from Dun & Bradstreet. Questionnaires were completed by the head of human resources. We chose the head of human resources as our key respondent for a variety of reasons. First, we expect HR managers to be most knowledgeable senior managers about the topics in question. Second, as most surveys to MNC subsidiaries target managing directors, we tried to overcome survey fatigue by directing the survey to a functional manager. Finally, HR could be expected to be one of the most localized functions. Indeed, our results showed that 95% of the HR managers were host country nationals, a higher percentage than any of the other functional areas. This is an important advantage, as it limits the potential bias of having a mix of host country and expatriate respondents. Finally, previous research suggests that HR managers’ assessments of subsidiary knowledge in- and outflows are highly consistent with the assessments of other subsidiary executives (Chang et al., 2012).

Both online and paper questionnaires were used in our study and data were collected over a nearly two-year period (August 2008 – April 2010). An initial mailing and one reminder were used to increase response rates. Originally, we intended to collect all data online, but it soon transpired that not all respondents were comfortable with this. We therefore also offered a paper version in most countries. To verify whether the different data collection methods had influenced the results, mean scores for all variables in each country were compared between the online and paper version. Four countries (the UK, Australia/New Zealand, Germany and



Spain) displayed small, but significant differences on a limited set of variables. However, further investigation showed this was most likely the result of one of the versions having an over- or under-representation of culturally and linguistically closer HQ countries. The method of data collection therefore did not seem to significantly influence our results and online and paper questionnaires were merged.

In total, we received 817 questionnaires, resulting in an overall response rate of 13.83% after correcting for undeliverables. As response rates for international mail surveys typically varied between 6 and 16% (Harzing, 1997) even 15 years ago, the response rate is not unusual for multi-country studies. However, response rates did vary by country, from a low of 4.0% for China to a high of 47.6% for Korea. Korea was the only country in which we approached companies by telephone through a local agency and this is likely to have increased response rates. The low response rate in China might have been caused by the fact that we did not send out paper questionnaires in this country, and that our website was blocked for part of the data collection period. However, we had mailed out a very large number of questionnaires in China as we had already expected a low response. Hence, in terms of absolute numbers, we still achieved a satisfactory response.

Two sets of analyses were performed to assess the possibility of non-response bias. We first compared the size and age of the responding subsidiaries with those for which we did not receive a response. Neither subsidiary size (581.25 vs. 586.15 employees,  $p = .96$ ) nor the year of establishment (1982.53 vs. 1984.42,  $p = .123$ ) showed a significant difference. We then compared responses from respondents to the first mailing to responses from respondents to the reminder on all variables in our study. Late respondents are seen to be more representative of non-respondents than early respondents (Armstrong & Overton, 1977). We did not find systematic significant differences on any of the variables. Our analyses therefore suggest that non-response bias is not a problem in our study.

### *Questionnaire Development and Measures*

We collected data for this study through a questionnaire survey, developed after an extensive review of the relevant literature. The data with regard to expatriate presence in key functional areas (both parent country nationals and third country nationals) were collected by giving the respondent a list of eight key functions and asking him/her to indicate whether the incumbent was a local manager, a HQ expatriate (PCN) or an expatriate from another country (TCN). As not all subsidiaries might have formally defined functions in each area, we also offered “no such position” as an answer category. In order to calculate the proportion of expatriates in a particular function the number of PCNs and TCNs in this function were combined. We also asked respondents to list the total number of expatriates working in the subsidiary as well as reporting on the number of current subsidiary employees that had been on an inpatriate assignment at HQ. We are cognizant that, especially in larger organizations, the HR managers’ responses to the latter question might contain a degree of inaccuracy. However, the fact that less than 8% of the questionnaires contained missing data for this question seems to suggest that most HR managers felt comfortable answering this question. We would have preferred to also have exact information on the number of managers in the top management team that had inpatriate experience, but we felt that it would be too difficult for the HR manager to provide reliable information on this. Hence we decided to settle for an estimate of the former inpatriates in the subsidiary as a whole.

Our measures of knowledge transfer from and to HQ were adapted from Gupta and Govindarajan’s (2000) measure. We asked respondents “to what extent does this subsidiary provide (receive) knowledge and/or skills to (from) HQ in the following areas” for each of the following areas: R&D, manufacturing, distribution/logistics, marketing/sales, human resource management. The answer options ranged from 1 (= not at all) to 7 (= very much). For Hypotheses 2a-2d, the five items for each knowledge transfer from and to HQ were then

averaged to form a scale score ( $\alpha = .85$ , both for knowledge transfer from HQ and for knowledge transfer to HQ). For Hypotheses 1a and 1b, we used the individual items.

As English-language questionnaires can obscure national differences through a reduction of variance, questionnaires were translated into the local language for most countries. The Nordic countries were the only exception; relatively small sample sizes meant that translation into an additional four languages (Finnish, Swedish, Danish and Norwegian) was not cost effective. We also expected that our respondents in these countries would be fluent enough in English to provide reliable responses. However, we did translate the survey instrument into Chinese, Japanese, Korean, German, French and Spanish.

The initial translation was conducted by bilingual research assistants under the close supervision of the project coordinator. We then used a focus group consisting of both the translator and two or three other bilingual students to verify the translation in a 2-step process. First, the translated questionnaire was reviewed one item at a time, and focus group members were asked to indicate whether the text sounded “natural” to them. Then, in the second step, focus group members reviewed the original English sentence for equivalence with the native version. Even if only one of the members indicated the item didn’t “sound right” or was not fully equivalent, a discussion was initiated by the translator to find a better translation. The project coordinator was available during this entire process to provide feedback on the meaning behind the questions. This process took approximately 3-4 hours for the European languages, whereas for the Asian languages three sessions of 2-3 hours each were necessary.

## **Results**

### *Descriptive Results*

Before testing our hypotheses, we first provide a brief descriptive overview of the use of PCNs, TCNs and former inpatriates in our sample as well as the proportion of expatriates in various functions. Table II reports the proportion of PCN and TCN managing directors. As

previous studies have shown (Belderbos & Heijltjes, 2005; Gaur, Delios, & Singh, 2007; Kopp, 1994; Pudelko & Tenzer, 2013), Japanese MNCs have a much higher tendency to employ PCNs as managing directors. However, our data show that this is also the case for Korean MNCs and MNCs hauling from “Chinese” Asian countries. We also confirm earlier findings (e.g., Harzing, 2001b; Tungli & Peiperl, 2009) that the Nordic and Anglo countries have a lower tendency to use PCNs, whereas the level of expatriation is generally higher in MNCs from the larger continental European countries. In comparison with Harzing’s (2001b) study, which reported on data collected in the mid-nineties and is the only study that provides a comprehensive overview of levels of expatriation in a large number of home and host countries, the proportion of PCNs in the managing director role has declined for nearly every home and host country and overall is only about 60% of what it was in the mid-nineties.

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Insert Table II about here  
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Table 2 also shows that – at nearly 8% – TCNs no longer have the negligible presence they did in prior studies (Harzing, 2001b; Peterson, Napier, & Shul-Shim, 2000; Tung, 1982). When compared with the declining proportion of PCNs, the increase of TCNs is particularly noticeable. Whereas in prior decades the proportion of TCN managing directors was very small in comparison to the proportion of PCN managing directors, they now make up approximately one third of the proportion of PCNs.

With regard to inpatriates, on average more than one in every 100 subsidiary employees has been on an assignment to HQ and on average every subsidiary employs more than three employees who have been inpatriates. Overall, nearly half of the subsidiaries have one or more former inpatriates in their workforce. Inpatriation is clearly no longer a rare phenomenon. Our findings suggest that, compared to previous studies (Peterson et al., 2000; Tharenou & Harvey, 2006; Tungli & Peiperl, 2009), the use of inpatriation has increased. In fact, when we

compared the number of expatriates and former inpatriates (absolute and proportionally), we found that the two were nearly identical. On average each subsidiary had 3.29 former inpatriates and 4.03 expatriates (including those at senior management levels). Per 100 employees, each subsidiary had on average 1.16 former inpatriates and 1.22 expatriates.

Finally, Table III shows the top management positions in our subsidiaries, ordered by the proportion of expatriates. The highest proportion of expatriates is found in the managing director position. There is also a fairly clear distinction between the different functional areas, with R&D and Marketing having the highest proportion of expatriates in the leading position and HRM the lowest. Manufacturing and Logistics fall between these two extremes. Although this broadly confirms previous findings by Rosenzweig (1994) and Harzing (2001b) who reported similar results for the HRM function and Pudelko and Tenzer (2013), the proportion of expatriates in the Marketing function is much higher than expected, a result that was also found by Pudelko and Tenzer (2013) for Japanese companies.

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Insert Table III about here  
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*Expatriates as Heads in Different Functions and Implications for Knowledge Transfer*

Linking the presence of PCNs in the various functional areas explicitly to knowledge transfer, Hypothesis 1a suggested that having an expatriate heading up the function in question would lead to a higher level of knowledge transfer from HQ for this particular function. Table IV reports the results of a t-test comparison between the level of knowledge transferred from HQ to subsidiaries in subsidiaries with an expatriate in a particular function versus subsidiaries with a local manager in that function. In addition to the five functional area heads for the functional areas for which we have knowledge transfer data, we also included the managing director in the analysis. For each function, except Marketing, there is a significantly higher

level of knowledge transfer from HQ if the subsidiary has an expatriate in that function, hence largely confirming Hypothesis 1a.

In most cases employing an expatriate as the head of *another* function than the function in question doesn't show a significant relationship to knowledge transfer for the function in question. However, having an expatriate as head of the Manufacturing function is positively related to knowledge transfer from HQ in *all* functions, though more so in Manufacturing than in other functions. In addition, having an expatriate as managing director is associated with a significantly higher knowledge transfer in R&D and Manufacturing, though less so than having an expatriate functional head in this area. It is also positively related to knowledge transfer in Marketing.

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Insert Table IV about here  
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As reported in Table V, a rather different picture is found for Hypothesis 1b, which proposed that having an expatriate as head of the functional area would be associated with a higher level of knowledge transfer *to* HQ in that function. In the more localized functions, Logistics and HRM, we find the same pattern as for knowledge transfer *from* HQ in that knowledge transfer to HQ for this function is significantly higher when an expatriate is heading this function. However, this is not the case for R&D, Manufacturing and Marketing, providing only partial support for Hypothesis 1b. Having an expatriate managing director has no significant impact on knowledge flows to HQ in most functions, but interestingly has a significant *negative* impact on knowledge transfer to HQ in R&D, i.e. subsidiaries with a local managing director transfer more R&D knowledge to HQ than subsidiaries with an expatriate managing director.

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Insert Table V about here  
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Hence we find that for R&D and Manufacturing the presence of an expat in the top function only seems to influence the transfer of knowledge from HQ to subsidiaries, whereas for Logistics and HRM the presence of an expat in the top function is associated with two-way transfer of knowledge. Interestingly, an expatriate in the Logistics function is associated with higher levels of knowledge transfer to HQ in the area of manufacturing and HRM as well. In general, however, it appears that expatriates are less effective in transferring knowledge to HQ than from HQ. We will look into this in more detail in the next section, where we compare expatriates and inpatriates.

Of course knowledge transfer from and to HQ in a particular function might be influenced by a range of other factors beyond whether the individual heading up that function is an expatriate or a local manager. Therefore, we also ran a general linear model analysis for each area of knowledge transfer, in which we included not just the distinction between expatriate and local, but also controlled for country of origin of HQ, host country of the subsidiary, industry in which the subsidiary operated, as well as subsidiary age, size and type of establishment (greenfield vs. acquisition). The results (available from the authors upon request) were very similar to those reported above and hence are not reported. In each of the above cases for which we reported a significantly higher degree of knowledge transfer when the function was headed by an expatriate, having an expatriate in the position was the single most important determinant for knowledge transfer in that function, with few of the other factors reaching significance in the analyses.

#### *The Particular Relevance of Inpatriates for Knowledge Transfer from and to HQ*

We hypothesized that both expatriates and inpatriates would play an important role in the transfer of knowledge from HQ to subsidiaries (Hypothesis 2a) and from subsidiaries to HQ (Hypothesis 2b). As Table VI shows, the extent of knowledge transfer from HQ to subsidiaries is significantly higher for subsidiaries employing expatriates as well as for

subsidiaries employing former inpatriates when compared to subsidiaries that only employ locals. Thus, we find full confirmation for Hypotheses 2a. With regard to knowledge transfer from subsidiaries to HQ, we find that this is significantly higher for subsidiaries with former inpatriates, but not for subsidiaries with expatriates, thus only partially confirming Hypothesis 2b. The difference for expatriates is in the expected direction however.

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Insert Table VI about here  
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As for Hypotheses 1a and 1b, we also ran a general linear model analysis, in which we included not just the distinction between subsidiaries with and without expatriates/ former inpatriates, but also controlled again for country of origin of HQ, host country of the subsidiary, industry in which the subsidiary operated, as well as subsidiary age, size and type of establishment (greenfield vs. acquisition). The results (available from the authors upon request) were similar to those reported above and hence are not reported: subsidiaries with inpatriates having significantly higher levels of knowledge transfer both from and to HQ ( $p < 0.001$ ), and subsidiaries with expatriates only showing a significantly higher level of knowledge transfer from HQ ( $p < 0.05$ ).

Table VI showed that the difference in knowledge transfer from HQ to subsidiaries is very similar between subsidiaries with only local managers on the one hand and subsidiaries with inpatriates or expatriates on the other hand. The results in Table VII show that although the level of knowledge transfer from HQ is slightly higher in subsidiaries with inpatriates than it is in subsidiaries with expatriates, it is not significantly different, thus confirming Hypothesis 2c. For knowledge transfer to HQ, we already found that subsidiaries with expatriates do not show a significantly higher level of knowledge transfer, whereas subsidiaries with inpatriates do. The results in Table VII show that this difference is statistically significant, thus confirming the differential effect predicted in Hypothesis 2d.



Many subsidiaries will have both expatriates and inpatriates in their workforce. Therefore, we explored our results further by investigating whether it mattered if subsidiaries had *both* expatriates and former inpatriates or whether *one* of these two groups of international assignees would be sufficient. These results are also presented in Table VII. Regarding knowledge transfer from HQ, having only inpatriates results in statistically significantly higher levels of knowledge transfer in comparison to having no international assignees. For subsidiaries with expatriates only, the difference towards subsidiaries without any international assignees is not significant. The highest level of knowledge transfer from HQ was found in subsidiaries in which expatriates and former inpatriates were simultaneously present, but the difference with inpatriates only is not statistically significant.

With regard to knowledge transfer from subsidiaries to HQ, we also find that subsidiaries with only expatriates do not have higher levels of knowledge transfer than subsidiaries without any assignees. Subsidiaries with only former inpatriates have similar degrees of knowledge transfer as subsidiaries with both former inpatriates and expatriates, but higher levels of knowledge transfer than subsidiaries without assignees or with only expatriates. It should be acknowledged that the group of subsidiaries with only former inpatriates is fairly small and hence our results might be influenced by sample idiosyncrasies. However, our results do seem to indicate that inpatriation is *more* important than expatriation in terms of facilitating knowledge transfer from and especially to HQ.

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 Insert Table VII about here  
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## Discussion

### *Implications for Research*

The overall objective of our large scale survey was to investigate the role of expatriates and former inpatriates in knowledge transfer between HQ and foreign subsidiaries of MNCs.

For PCNs, still by far the largest group of expatriates, we found their share as managing directors in foreign subsidiaries to be significantly lower compared to what previous studies revealed. At the same time, our data indicate that the use of TCNs, the remaining group of expatriates, is now higher than reported by previous studies. The same applies to former inpatriates. Consequently, we are able to confirm initial suggestions that global staffing practices at the subsidiary level are gradually changing (Collings et al., 2007) and that MNCs are increasingly using a portfolio of international assignees (Collings et al., 2010). In addition to such changes over time, our study also indicates significant variation across countries and regions (see also Peterson et al., 2000; Tungli & Peiperl, 2009). For example, according to our data the PCN quota of managing directors of Japanese and Korean MNCs is more than eight times as high as that of MNCs of Nordic countries, but the TCN quota is about three times as high for Nordic MNCs as for Japanese and Korean MNCs. This suggests a much higher degree of ethnocentrism for MNCs from Asian countries (see also Bruning, Bebenroth, & Pascha, 2011; Peterson et al., 2000; Tung, 1982). Even more extreme differences can be observed in terms of host countries with twelve times as many PCN managing directors running subsidiaries in China compared to subsidiaries in Nordic countries, suggesting significant differences in the need for control and communication (see also Smale, Björkman, & Sumelius, 2013).

In general terms, our study indicates how important it is to repeat studies periodically to obtain information about changes in management practices over time, and at the same time to include a broad and theory-based sample of countries to learn about country differences, and avoid unwarranted generalizations. Similarly, given the increasing relevance of TCNs and inpatriates, our findings also indicate that more research on these two forms of international assignees is long overdue.

The increasing use of different types of assignees has important consequences for knowledge transfer in MNCs. This is in particular the case, given the increasing complexities

MNCs are facing in their external and internal environment, which result in heightened pressures for more effective knowledge transfer between HQ and subsidiaries. While our findings suggest that a declining proportion of PCNs and an increasing proportion of TCNs in the managing director role, as well as an increased use of inpatriation more generally, are linked to positive effects on knowledge transfer from and in particular to HQ, we do not know yet whether MNCs changed their staffing patterns for this particular reason. We encourage future research to further elaborate on the motivations behind these changes in staffing patterns.

To obtain a nuanced understanding of international staffing patterns, we reported the extent to which the different functional areas were headed up by an expatriate manager. We found that the proportion of expatriates in the managing director position is higher than the proportion of expatriates in the position of functional heads. Furthermore, our data indicate a higher prevalence of expatriates in more technical and therefore less culture-sensitive management functions (e.g., R&D) compared to more people-related and therefore more culture-sensitive functions (e.g., HRM).

Somewhat surprising was the finding that PCNs were relatively frequent in the Marketing function. Despite a similar result by Pudelko and Tenzer (2013), we expected, following Fang et al. (2010), that this function would be relatively localized, due to locally specific consumer preferences and market conditions. However, similar to R&D, Marketing is apparently becoming a more strategically important function. At same time, we did not find a significant increase in function-specific knowledge transfer, neither from nor to HQ, if an expatriate headed the Marketing function. This suggests that while Marketing may be of increasing strategic importance, differences in local consumer preferences and market conditions may limit the scope for cross-unit knowledge transfer. In more general terms, our results indicate how important it is to seek disaggregate information across a variety of functions to arrive at meaningful and nuanced conclusions.

Testing for Hypotheses 1a and 1b, which addressed the effect of having an expatriate heading up the functional area on knowledge transfer, our results indicated that knowledge transfer *from* HQ was significantly higher in all but one functional area in subsidiaries that employed an expatriate rather than a local manager as head of the respective functional area. The effects were particularly strong for R&D and Manufacturing, areas in which many MNCs are seen to possess core competencies which need to be transferred to foreign subsidiaries. Regarding knowledge transfer *to* HQ the same pattern was only found for the Logistics and the HRM functions. Consequently, our findings indicate that expatriates' ability in passing on knowledge is in fact asymmetrical as they appear to be more effective in transferring knowledge from HQ than to HQ. Our data might also suggest that knowledge transfer to HQ is more prevalent when the function is headed by a local manager with inpatriate experience, a proposition we were unable to test in this study. We consider this to be a highly relevant suggestion to which we return below when addressing practical implications.

When exploring the variation among international assignees in terms of their knowledge transfer role in more depth (Hypotheses 2a and 2b), our results indicate that knowledge transfer from HQ to subsidiaries is significantly higher for subsidiaries employing expatriates and/or inpatriates compared to those that don't. Regarding knowledge transfer in the reverse direction, i.e., from subsidiaries to HQ, we established that this is significantly higher for subsidiaries with former inpatriates, but not for subsidiaries with expatriates. Interestingly, the presence of former inpatriates appears to be more strongly related to knowledge transfer than that of expatriates, both for knowledge transfer from and to HQ. This finding provides evidence to the contention that assignees may benefit their organization beyond the actual relocation, and that it is important to account for these benefits when evaluating repatriation outcomes (Lazarova & Cerdin, 2007). While Gong (2003) argued that expatriates are important for the efficient and effective transfer of tacit knowledge from HQ, we would argue that former inpatriates may be even more suited to pass on implicit and tacit

knowledge to their fellow countrymen as they better understand the perspective of the information recipients (Fang et al., 2010; Reiche, 2012). By comparison, expatriates might be less apt to pass on implicit knowledge, given their lesser in-depth cultural and institutional knowledge that is required to appreciate the locals' viewpoints. While expatriates might acquire this capability over time, usually their task is to be corporate representatives and ambassadors of the HQ's points of view (Gregersen, Hall, & Black, 1996). Given this role, expatriates should be particularly sensitive to absorb implicit and tacit knowledge which they subsequently might pass on to HQ.

Overall, our results suggest that inpatriation is at least as important as expatriation in terms of knowledge transfer from and in particular to HQ. Therefore, it appears important to differentiate among various types of international assignees and not rely only on data about expatriates, as has been frequently the case with prior studies. Research that only relies on expatriates as international assignees is at best incomplete and at worst misleading.

Furthermore, our study reveals how important it is to differentiate between the directions of knowledge flows and to consider international assignees' asymmetrical ability to transfer knowledge. In more general terms, our results for local managers, PCNs, TCNs and former inpatriates suggest that these different actors represent different knowledge transfer patterns. Therefore, it seems justified to study these groups separately instead of limiting the analysis to the aggregate level of the unit itself (see also Felin & Hesterly, 2007; Tharenou & Harvey, 2006). Ultimately, our diverse findings across the various home and host country contexts suggest that it is important to avoid generalizations based on evidence from just a few countries.

In conclusion, our study has indicated the relevance of differentiation in terms of types of international assignees, their rank, their unequal ability to transfer knowledge in different directions, and finally in terms of various home and host countries. Taking this information

into account is crucial when implementing an international staffing strategy that meets the requirements of successful knowledge transfer.

### *Implications for Practice*

Comparing expatriates to local subsidiary managers, our data suggest that MNCs should consider the former for the role of knowledge transmitters, specifically for knowledge transfer from HQ to subsidiaries. The managing director in particular is of relevance here as he is likely to be well linked to sources of knowledge at HQ (Reiche et al., 2009). However, the heads of management functions such as R&D and Manufacturing are also important in this context, as such technical and less context-specific functions allow for a higher degree of standardization around HQ practices (Kogut & Zander, 1992). The Manufacturing function has proven to be of particular significance, as our data indicated that having an expatriate as head of the Manufacturing function is positively related to knowledge transfer from HQ to subsidiaries not just within this function but to *all* functions. One reason for this might be that Manufacturing generally shows a close interaction with all other functional areas.

Companies should consider though that whereas expatriates might be particularly suitable to pass on knowledge from HQ to subsidiaries, they appear to be less befitting to transfer knowledge into the opposite direction. While expatriates might have primarily the role to pass on knowledge from HQ to subsidiaries, MNCs should encourage and coach their expatriates not to neglect their potential as knowledge transmitters to HQ, particularly regarding implicit knowledge. Furthermore, given the apparent asymmetric capability of expatriates to pass on knowledge from and to HQ, companies should also consider other forms of international staffing for knowledge transfer, specifically regarding knowledge transfer to HQ. In fact, the comparison of our data with results from previous studies also suggests that MNCs increasingly employ alternatives to the use of local subsidiary managers or PCNs at the subsidiary level, namely former inpatriates and TCNs. Based on our data we encourage

companies to consider former inpatriates in particular for knowledge transfer to HQ (see also Harvey et al., 2001). Finally, as we were able to show how substantially staffing patterns varied across national boundaries, any recommendation regarding the relation between staffing and knowledge transfer should always be viewed with the specific home and host country context in mind. In conclusion, we have demonstrated how important it is for corporations to base staffing policies on differentiated and contextualized information and to seek solutions that in their complexity match the complexity of their tasks.

### *Limitations and Future Research*

Despite its various contributions, our study has several limitations that merit consideration, in particular as they might suggest challenges for future research. First, although our study was the first to empirically establish that knowledge transfer in a particular functional area is higher when the function is headed by an expatriate rather than a local manager, our measures of functional knowledge transfer were single-item measures. Now that this relationship has been established on a general level, future studies could test this relationship for specific functions using more sophisticated measures of knowledge transfer.

Furthermore, we were unable to perform specific analyses for TCNs, due to the relatively low numbers in this category. Hence, more detailed information on TCNs would be of interest. We acknowledge that TCNs have thus far been a less frequent phenomenon in MNCs, but their presence appears to be increasing. More importantly, TCNs can potentially play an important role in transferring knowledge not only vertically, i.e. between HQ and subsidiary, but also horizontally, i.e. between subsidiaries of different countries. As long as the number of TCNs is too low for meaningful statistical analysis, as was the case in our survey, qualitative research might obtain interesting information for this under-researched category of international assignees.

In our analyses of knowledge transfer in specific functions, data unavailability also precluded us from testing the role of top managers with inpatriate experience. Our results with regard to inpatriates more generally suggest, however, that this group might be particularly effective in knowledge transfer to HQ. Hence it would be interesting for future research to explore whether knowledge transfer to HQ in specific functions is stronger for top managers with inpatriate experience than for top managers who are expatriates.

In more conceptual terms, we repeatedly called for more differentiation when investigating knowledge flows between HQ and subsidiaries and so we provided a differentiated approach across management functions, directions of knowledge transfer and type of international assignees. Another differentiation that we were able to address only at a conceptual level is that between two types of knowledge transfer: direct and indirect. Whereas we were unable to differentiate between these two forms in our survey, pursuing this distinction empirically for the various types of international assignees and local managers promises valuable insights. Also, while our study focused on the actual knowledge transfer, future research could investigate not only the actual (direct and indirect) knowledge transfer practices, but also motivations and abilities to share knowledge.

Furthermore, our study was limited to the analysis of global assignees at the subsidiary level. Given that we conducted our research in thirteen host countries and collected information from over 800 subsidiaries, we were able to collect data on those international assignees working in a foreign subsidiary: PCNs, TCNs, and former inpatriates. However, it would also be of interest to obtain data for those categories of international assignees working at HQ: current inpatriates as well as repatriates. Similarly, to better understand the way knowledge transfer activities develop in the transition from a PCN expatriate to a repatriate and from an inpatriate to a former inpatriate, longitudinal studies could offer further significant insights.



## **Concluding Remarks**

While we are far from suggesting that we have conclusively answered all open questions regarding the relationship between global staffing and knowledge transfer, our study is the first that explicitly investigated the relationship between different categories of international assignees and knowledge transfer in MNCs. As a result, we were able to show substantial differences in the prevalence of expatriates as heads of functional areas and the impact this has on function-specific knowledge transfer from and to HQ, as well as reveal the varying relevance of expatriates and former inpatriates for knowledge flows from and to HQ.

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**TABLE I. Distribution of Sample across Host Country, Industry and Home Country**

<b>Host country</b>	<b>Number of respondents</b>	<b>Home country</b>	<b>Number of respondents</b>
Australia/New Zealand	92	Chinese Asia	32
China	91	France	67
France	70	Germany	107
Germany	125	Japan/Korea	89
Japan	80	Netherlands	35
Korea	118	Nordic countries	72
Nordic countries	71	Switzerland	42
Spain	82	United Kingdom	56
United Kingdom	88	United States	222
<b>Total</b>	<b>817</b>	Other	91
		<b>Total</b>	<b>817</b>
<b>Industry</b>	<b>Number of respondents</b>		
Banking & Insurance	20	Motor vehicles & parts	138
Business Services	78	Paper & allied products	33
Chemicals	129	Pharmaceuticals	73
Food & Beverages	55	Rubber & Plastics	60
Industrial Machinery	130	Other	71
Measuring & analyzing instruments	30	<b>Total</b>	<b>817</b>

**TABLE II. Proportion of PCNs and TCNs as Managing Directors for Different Home and Host Countries**

<b>Home country</b>	<b>% PCN MD</b>	<b>% TCN MD</b>	<b>Host country</b>	<b>% PCN MD</b>	<b>% TCN MD</b>
Nordic countries	7.5%	13.4%	Nordic countries	5.9%	10.3%
Netherlands	12.5%	3.1%	Germany	10.1%	5.9%
USA	12.6%	4.2%	France	15.9%	6.3%
Switzerland	15.8%	2.6%	Japan	16.3%	10.2%
United Kingdom	21.7%	10.9%	United Kingdom	18.4%	6.6%
Germany	25.3%	12.6%	Spain	20.3%	11.4%
France	31.7%	11.7%	Australia/NZ	24.1%	8.4%
Chinese Asia	54.8%	9.7%	Korea	33.0%	3.7%
Japan/Korea	63.6%	4.5%	China	72.1%	10.5%
<b>Mean</b>	<b>24.9%</b>	<b>7.8%</b>	<b>Mean</b>	<b>24.9%</b>	<b>7.8%</b>

**TABLE III. Proportion of Expatriates as Heads of Different Functional Areas**

<b>Functional area</b>	<b>Proportion of Expatriates as Head of the Functional Area</b>
Managing director	32.7%
Research & Development	17.8%
Marketing	15.9%
Manufacturing	9.6%
Logistics	7.6%
Human Resource Management	5.5%

**TABLE IV. Significance of the Increase in Knowledge Transfer from HQ with Expatriates rather than Local Managers as Head of the Different Functions**

<b>Expatriate in the following functions:</b>	<b>Increase in knowledge transfer from HQ to subsidiary in the following areas:</b>				
	<b>R&amp;D</b>	<b>Manufacturing</b>	<b>Logistics</b>	<b>Marketing</b>	<b>HRM</b>
<b>Managing director</b>	<b>t=3.525***</b>	<b>t=3.827***</b>	<b>t=1.192</b>	<b>t=3.085**</b>	<b>t=0.610</b>
<b>R&amp;D</b>	<b>t=5.070***</b>	t=2.279**	t=1.325	t=1.408	t=0.644
<b>Manufacturing</b>	t=3.283***	<b>t=6.199***</b>	t=4.059***	t=2.234*	t=2.298*
<b>Logistics</b>	t=0.374	t=1.078	<b>t=2.377*</b>	t=2.183*	t=1.164
<b>Marketing</b>	t=1.673	t=1.751	t=0.022	t=1.096	t=0.354
<b>HRM</b>	t=0.168	t=.914	t=1.393	t=1.792	<b>t=2.660**</b>



**TABLE V. Significance of the Increase in Knowledge Transfer to HQ with Expatriates rather than Local Managers as Head of the Different Functions**

Expatriate in the following functions:	Increase in knowledge transfer from subsidiary to HQ in the following areas:				
	R&D	Manufacturing	Logistics	Marketing	HRM
<b>Managing director</b>	t=-3.221***	t=1.477	t=1.325	t=0.229	t=0.105
<b>R&amp;D</b>	t=0.685	t=1.430	t=0.874	t=0.617	t=1.187
<b>Manufacturing</b>	t=-1.013	t=0.635	t=0.278	t=0.054	t=0.813
<b>Logistics</b>	t=1.334	t=2.800**	<b>t=3.195**</b>	t=0.493	t=2.778**
<b>Marketing</b>	t=0.790	t=1.855	t=2.151*	t=0.647	t=1.456
<b>HRM</b>	t=0.422	t=1.710	t=1.416	t=1.576	<b>t=2.254*</b>

**TABLE VI. Significance of the Increase in Knowledge Transfer for Subsidiaries with Expatriates and Former Inpatriates**

Type of subsidiary	Direction of knowledge transfer	
	From HQ to subsidiaries	From subsidiaries to HQ
Subsidiaries with vs. subsidiaries without expatriates	t = 4.183 p = 0.000	t = 1.487 p = 0.138
Subsidiaries with vs. subsidiaries without former inpatriates	t = 5.497 p = 0.000	t = 3.780 p = 0.000

**TABLE VII. Knowledge Transfer Compared between Subsidiaries with Different Types of International Assignees**

Type of subsidiary	Direction of knowledge transfer	
	From HQ to subsidiaries	From subsidiaries to HQ
No international assignees (n=222)	3.67 <sup>a</sup>	3.91 <sup>a</sup>
Only expatriates (n=171)	3.93 <sup>ab</sup>	3.88 <sup>a</sup>
Only former inpatriates (n=62)	4.15 <sup>bc</sup>	4.33 <sup>b</sup>
Both expatriates & inpatriates (n=276)	4.34 <sup>c</sup>	4.29 <sup>b</sup>
	F=4.777, p=0.003	F=11.735, p=0.000

\* Means with the same superscript are not significantly different from each other (p=0.05, Duncan post hoc comparison)